

```
#####
#
# Generation of Class 1 by Continued Fractions
#
#####
# Auxiliary functions
#
# Add '1' to the first term
#
add1 <- function(v){
  w <- v; w[1] <- w[1] + 1
  return(w)
}
#
# Insert '0' as the first term
#
insert0 <- function(v){
  w <- v; w <- c(0, w[-length(w)])
  return(w)
}
#
# Remove first term
#
remove1 <- function(v){
  w <- v; w <- c(v[-1], NA)
  return(w)
}
#
#####
# MAIN
#
main.1.CF <- function(system, maxlevel){
  m <- maxlevel # maxlevel > 2; by choice
  a <- matrix(rep(NA, (2^m-1)*m), ncol = m)
  #
  a[ 1, 1 ] <- 1
  #
  a[ 2, 1:2 ] <- c(0,2)
  a[ 3, 1 ] <- 2
  #
  if(system == 1){
    #
    # CW
    #
    for(n in 2:(2^(m-1)-1)){
      if(n%%2 == 0){
        a[2*n , ] <- a[n, ]; a[2*n , 1] <- remove1(a[2*n , ])
        a[2*n , 1] <- add1(a[2*n , 1])
        a[2*n , ] <- insert0(a[2*n , ])
        a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- add1(a[2*n+1, 1])
      }
      if(n%%2 != 0){
        a[2*n , ] <- a[n, ]; a[2*n , 1] <- insert0(a[2*n , ])
        a[2*n , 1] <- add1(a[2*n , 1])
        a[2*n , ] <- insert0(a[2*n , ])
        a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- add1(a[2*n+1, 1])
      }
    }
    #
    if(system == 2){
      #
      # driB
      #
      for(n in 2:(2^(m-1)-1)){
        if(n%%2 == 0){
          a[2*n , ] <- a[n, ]; a[2*n , 1] <- add1(a[2*n , 1])
          a[2*n , ] <- insert0(a[2*n , ])
          a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- remove1(a[2*n+1, 1])
          a[2*n+1, 1] <- add1(a[2*n+1, 1])
        }
        if(n%%2 != 0){
          a[2*n , ] <- a[n, ]; a[2*n , 1] <- add1(a[2*n , 1])
          a[2*n , ] <- insert0(a[2*n , ])
          a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- insert0(a[2*n+1, 1])
          a[2*n+1, 1] <- add1(a[2*n+1, 1])
        }
      }
    }
    #
    if(system == 3){
      #
      # Yu-Ting
      #
      for(n in 2:(2^(m-1)-1)){
        if(n%%2 == 0){
          a[2*n , ] <- a[n, ]; a[2*n , 1] <- remove1(a[2*n , ])
          a[2*n , 1] <- add1(a[2*n , 1])
          a[2*n , ] <- insert0(a[2*n , ])
          a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- remove1(a[2*n+1, 1])
          a[2*n+1, 1] <- add1(a[2*n+1, 1])
        }
        if(n%%2 != 0){
          a[2*n , ] <- a[n, ]; a[2*n , 1] <- insert0(a[2*n , ])
          a[2*n , 1] <- add1(a[2*n , 1])
          a[2*n , ] <- insert0(a[2*n , ])
          a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- insert0(a[2*n+1, 1])
          a[2*n+1, 1] <- add1(a[2*n+1, 1])
        }
      }
    }
  }
}
```

```

#
# if(system == 4){
#
# Yurra-1
#
# for(n in 2:(2^(m-1)-1)){
#   if(n%%2 == 0){
#     a[2*n , ] <- a[n, ]; a[2*n , 1] <- add1(a[2*n , 1])
#     a[2*n , ] <- insert0(a[2*n , ])
#     a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- add1(a[2*n+1, 1])
#   }
#   if(n%%2 != 0){
#     a[2*n , ] <- a[n, ]; a[2*n , 1] <- add1(a[2*n , 1])
#     a[2*n , ] <- insert0(a[2*n , ])
#     a[2*n+1, ] <- a[n, ]; a[2*n+1, 1] <- add1(a[2*n+1, 1])
#   }
# }
#
# return(a)
#
#
# #####
#
# Examples: Build the beginning of all four systems
#
main.1.CF(system = 1, maxlevel = 5) # CW
main.1.CF(system = 2, maxlevel = 5) # driB
main.1.CF(system = 3, maxlevel = 5) # Yu-Ting
main.1.CF(system = 4, maxlevel = 5) # Yurramendi-1
#
# #####

```